DOCUMENT RESUME

ED 347 281 CE 061 380

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TITLE Massachusetts' Occupational and Educational Trends: The Need for Program Articulation.
INSTITUTION Massachusetts State Council on Vocational Education, Boston.
PUB DATE 89
NOTE 22p.; For related documents, see CE 061 376-381.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Articulation (Education); *College School Cooperation; Community Colleges; *Coordination; *Educational Cooperation; *Education Work Relationship; Futures (of Society); High Schools; Institutional Cooperation; Labor Force Development; Labor Needs; Technological Advancement; Two Year Colleges; Vocational Education
IDENTIFIERS *Massachusetts

ABSTRACT

Articulation has the potential to improve educational quality, enhance the efficient use of resources, respond effectively to diverse reform proposals, and sustain student interest in school. Technology is changing the nature of work and requires both better schooled and more highly trained workers. Partnerships between high schools and community colleges can help to supply Massachusetts and the nation with a skilled and knowledgeable work force. The demand for engineering technicians, computer technicians, systems analysts, programmers, computer operators, paralegals, and health care assistants will have the greatest growth in Massachusetts. Articulated programming can effectively provide the required advanced skills needed by new entrants to these occupations. Articulated programming between the high school and community college requires close curriculum coordination and regular communication between all actors. Benefits of articulation include: eliminating duplicative curriculum, thus allowing quick entry to the job market with a higher level of skills; opportunity to enter postsecondary education at advanced levels; and the potential for colleges to gain better prepared high school graduates. An established articulation program between the high school and community college can also help secondary students not in college preparatory programs to develop appropriate skills to complete their education. Articulation is a pathway to preparing a better educated work force and a better educated citizenry. (21 references) (YLB)

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PREFACE

This essay is a companion piece to the Council's other curriculum articulation works of 1989: Commonwealth Connections: An Inventory of Inter-System Vocational Education Agreements and Rx Articulation: A Guidebook to Successful Curriculum Articulation.

We hope these documents, in combination, will facilitate efforts around the State at increased and improved articulation between secondary and post-secondary education.

These works were produced as part of the Council's Dialogue Project which was made possible by a grant from the Board of Education and with the guidance of the Council's Leadership Committee:

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CATALYSTS FOR ARTICULATION PROGRAMMING

Demands for the American educational system to produce program excellence are growing at an unprecedented rate. In an effort to meet these demands, a barrage of education reform recommendations have been proposed. Many of the recommendations are familiar: better teachers, a return to basics, greater accountability, better discipline, longer school years, and more effective use of technology. Some recommendations are less familiar: different school governance, less hierarchical administration, school based management, teacher empowerment, increased teacher professionalism, alternative schools, and parental choice. All of these proposals have experienced varying levels of experimentation and in some cases, have improved student learning. However, it is clear that new standards, changes in organization, creative program development, and new roles for teachers are fatally flawed from the beginning if they do not include strategies that motivate students to learn, create credible incentives for students to remain in school, and establish the foundation for a sustained interest in life-long learning.

The pressure for a dramatic improvement in education and training is fueled by America's relative decline in productivity and global competitiveness. Although the reversal of this decline depends to a great extent on new economic initiatives by industry and government, it is widely acknowledged that a well educated and learning motivated

workforce is the bedrock for future economic prosperity. If our learners stay "at risk," our economy will also surely stay "at risk." As the M.I.T. Commission on Industrial Productivity has concluded, "without major changes in the ways schools and firms train workers over the course of a life-time, no amount of macro-economic fine-tuning or technological innovations will be able to produce significantly improved economic performance and a rising standard of living."[1]

While this document certainly does not argue that sophisticated program articulation between levels of education is a panacea for the immense challenge facing the worlds of education and training, it is a strategy aimed at quality and efficiency, able to accommodate reform proposals, and most importantly, conceived as a method to build and sustain student interest and involvement in the realms of learning and skill acquisition.

Articulation holds the promise of retaining students through high school and beyond. It can motivate students by facilitating access and preparation for post-secondary education.

The American Vocational Association describes program articulation as "a planned process linking two or more educational systems (high school and community college) to help students make a smooth transition from one level of instruction to another without experiencing delays or loss of credit." Articulation can be used to improve occupational programs, attract and retain students, reduce program costs, meet employer and student demands and build intersystem partnerships between the high school and community college. Once

established, these partnerships can form the basis for three-way partnerships with the employment training system that are more comprehensive than those with secondary or post-secondary providers alone.

In addition to addressing learning issues, the articulation of programs helps to meet financial needs of institutions faced with shrinking resources. Reducing duplication of effort, reducing dropouts, and increasing enrollments are inherent goals of any articulation program.

The large number of articulated programs nationwide, and in some states mandated articulation, are clear indications of its potential to play a significant role in educational reform. In Massachusetts, the community college movement of the sixties and seventies, which established occupational programs at the post-secondary level, combined with the concurrent establishment of a vast variety of secondary school vocational/occupational education opportunities created the foundation for substantial program articulation.

The college occupational programs provide low cost, highly accessible educational opportunities to adults. The regional vocational high schools and vocational programs in local school systems enable high school students to obtain a comprehensive vocational education while completing secondary school. Creating programmatic connections between these two levels of the educational system can only enhance student potential, institutional effectiveness, and the quality of the workforce.

It is important to emphasize that effective articulation demands a viable partnership between high schools and community colleges. The community college, must be organized to accept students with different amounts of previous training. Furthermore, since both levels accept students with varying levels of skill development, a major challenge for a well devised articulation system is to provide students an appropriate sequential curriculum, while preserving the integrity and self-sufficiency of each level's programming.

Today, interest in articulation is running high. Hundreds of discussions have been held around the nation involving high school and two-year college faculty and staff to discuss cooperation and articulation. In his book, The Neglected Majority, Dale Parnell (1985) said, "It is time to build a more effective partnership between secondary schools, community, technical, and junior colleges. Articulation is of great interest at the present time, especially to secondary vocational schools and two-year colleges."[2] Parnell's book also points out:

> That the complex technological world of the future is really already here. The emerging truth is that higher and more complex skills must be developed. Tasks once reserved for baccalaureate-degree holders are now being assumed by those with fewer years of education and training, and all workers must continue to learn throughout their careers to remain useful. Technology, as it becomes more commercial, will increase America's need for middle-range proficiencies.[3]

The importance of articulation was also emphasized by Massachusetts State leaders and policymakers in 1987 at a State Council sponsored conference. The Governors Office, Executive Office of Economic Affairs, Legislative Committee on Education, Board of Regents and Board of Education all agreed that the development of a State level policy on articulation and collaboration was crucial to the state's economy in the 1990's.

Skilled employees for technical jobs will be a major future need and technicians will have to learn more (within the same amount of time) than they ever had to learn before in order to meet changing and expanding job requirements.

Partnerships between high schools and community colleges can help to supply the state and the nation with a skilled and knowledegable work force. The national report, Workforce 2000: Work and Workers for the Twenty-First Century (1987), indicated that job prospects for high school graduates are decreasing rapidly. In fact, the report predicted:

1. That for the first time in the history of any workforce, the majority of all jobs in the United States will require some kind of postsecondary education;

2. Only 27 percent of all new jobs -- compared to 40 percent of all jobs today -- will require low-skilled workers;

3. Jobs currently considered to be in the middle of the skills distribution will be the least-skilled occupations of the future.

Business and industry will rely more and more on "off-the-job" training. Positions available to prospective employees will be directly related to their effective use of the vocational higher education system. Moreover, these predictions about labor market needs place increasingly higher demands on the performance of high schools. They suggest that the high school could insure greater employability of its students by articulating its programs with like or similar programs that are offered at the local community college.

As the decade of the eighties draws to an end, the growing need for individuals who are technically trained beyond the high school years is already apparent. More and more secondary schools and community colleges are shifting curriculum to match the technological needs of the information age:

> The growing pervasiveness of technology - and the certitude of ongoing technical advances - demand that we provide our young people with the solid base of

> scientific knowledge they will require. Those who use technology should also have a degree of understanding about the tools they use.[4]

High schools and community colleges must be aggressive in examining, developing and sustaining quality educational programs to serve the needs of a technically oriented society.

MASSACHUSETTS' OCCUPATIONAL NEEDS

Despite the current short-term slow down, projections from the Massachusetts Department of Employment and Training indicate that our economy will generate over 450,000 new jobs by the end of the 1990's. Technical and service occupations are projected to experience the greatest growth. Technical occupations alone will increase by 33%. The growth of technology will provide many new job opportunities for technologists and technicians with associate degrees and post-secondary certificates. In fact, the growth rate in these fields will be faster than in their professional counterparts. The chart below illustrates this trend.[5]

Occupation	Expected Growth		Profession	Expected Growth
Engineering Tech	45%	vs.	Engineer	41%
Paralegal	103%	vs.	Lawyer	37%
Dental Hygienists	31%	vs.	Dentist	20%

The combined pressures of competition and advancing technology will cause faster than average job growth rates in Massachusetts, especially for engineering technicians. Specific technical occupations projected to experience the greatest growth in Massachusetts are Computer Service Technician, Computer Programmer, Computer Analyst, and Electrical and Electronic Technicians.

Similarly the service occupations will continue to experience very strong growth. Of the total number of new jobs offered during the next decade, 40% will be in service occupations. Paralegal and health service occupations will

grow the fastest, followed by Data Processing. It is important to note that both these service and technical occupations require post-secondary education.

The Table below lists the 20 fastest growing jobs in the state which typically require post-secondary, non-baccalaureate education and the number of community colleges, out of the 15 total in the state, participating in articulated educational programs for each of these occupations.

OCCUPATIONAL GROWTH AND EDUCATIONAL ARTICULATION IN MASSACHUSETTS

Occupation	Employment[6] 1984	1995	Percent Increase	# Colleges[7] Articulatin
Paralegals	1,880	3,820	103.2	0
Computer Service Tech.	3,360	6,750	100.9	4
Computer Systems Analysts	14,450	26,150	81.0	2
Computer Programmers	15,880	27,650	75.0	6
Medical Assistants	1,720	2,790	62.2	1
Electrical & Electronic Tech.	21,140	32,940	55.8	11
Computer Operators	9,100	14,140	55.4	6
Travel Agents	2,840	4,180	47.2	1
Office Mach./Cash Reg. Service	1,140	1,640	43.9	0
Accountants	29,540	39,790	34.7	3
Medical Record Technicians	960	1,280	33.3	0
Nuclear Medicine Technologists	700	930	32.9	1
Mechanical Engineering Tech.	4,310	5,670	31.6	3
Recreational Therapist	1,220	1,660	31.1	0
Dental Hygienists	3,090	4,040	30.7	0
Registered Nurses	56,920	72,950	28.2	1
Civil Engineering Tech.	1,560	1,980	26.9	3
Commercial Artist	4,190	5,300	26.5	6
Industrial Engineering Tech.	960	1,190	24.0	3
Radiologic Tech.	3,440	4,210	22.4	1
Automotive Mechanics	19,340	23,360	20.8	4
Retail Merchandising	118,440	140,740	18.8	1

The State Council's 1989 inventory of articulation in Massachusetts, Commonwealth Connections, indicated that a little less than half of the State's articulated programs cover occupations that are on the list of the fastest growing jobs in

Massachusetts. With the associate degree becoming increasingly preferred for entry into many mid-level occupations, this data is at least encouraging. However, it is clear that a great deal more needs to be accomplished in matching curriculum development with new labor market trends. Substantial increases in effectively articulated programs are clearly desirable.

MAKING THE PARTNERSHIP WORK

Articulated programming between the high school and community college requires close curriculum coordination. Most of all, it will require high school and community college leaders and faculty members to talk regularly with one another, with the employment service sector, and with employers.

Moreover, articulation provides a particularly strong model for educators wishing to avoid loss of continuity in learning. It also brings enhanced program structure to the vocational student. Among the benefits achievable through a well developed program are the following:

- The development of improved basic skills;
- The opportunity for students to save time in post-secondary schooling by eliminating duplicative curriculum; thus allowing quick entry to the job market and with a higher level of skills;
- The opportunity for students to enter post-secondary education at advanced levels, thus exposing them to higher order skills without extending their time in formal schooling;
- Saving tuition costs while achieving saleable competencies in a time-shortened articulation program;
- The opportunity to encourage and to see the need for continuing education;
- Motivating students to remain in High School by illustrating the relevance of their education to obtaining well paying jobs and interesting career opportunities;
- The potential for colleges to gain better prepared high school graduates and perhaps larger numbers of graduates;
- The benefit to employers of having a labor pool better prepared in both basic and technical skills.

Many academically talented secondary school students have been well served over the years by the college-prep/baccalaureate degree course of study, and that effort must continue with even greater vigor and attention. However, the other half of the high school student population has not been served so well. Some 11 million students out of the 40 million now enrolled in elementary and secondary schools will not even graduate from high school.[8]

Of those students who do graduate, large numbers will do so without a sense of career direction or the prerequisites for college admission. Although some of these students may eventually find their way to the community college, they will not have the requisite preparatory background, and many will need remediation. An established articulation program between the high school and community college can assist these students in the development of appropriate skills to successfully complete their education.

It should also be noted that many adolescents in high school vocational programs are focused on immediate employment upon graduation, unaware of labor market conditions or uncertain of their own potential for college level learning. Articulated programs can encourage these students to continue their education and strive for greater career preparation, which will be an asset not only to their personal success, but also to the economic growth of the state.

There is a great need for community college and high school personnel to establish deep and lasting linkages that will produce higher academic performance and stronger occupational/vocational preparation.

CHALLENGES

Secondary/post-secondary program articulation has existed for decades, but today it is entering a new developmental cycle driven by a renewed sense of importance to students and community, the demand for educational excellence, the spread of new technology into most technical occupations, and the need to get the most out of shrinking resources during a time of declining enrollment. Educators who plan and operate occupational education programs across the nation recommend articulation as a viable and valuable system to address these issues.

The future will belong to the "smart worker" and the nations having the "smartest workers" will prosper the most. Any promising educational strategy should be judged by its potential for human resource development, and of course the development of individual interests, talents, and active democratic citizenship. Increasingly, articulation is seen as not only addressing these educational and economic needs, but doing so in a way that is cost effective and motivating.

Cooperative workplace systems will likely become the future means by which industry and business get the job done. "Smart workers" will have to know how to complete tasks cooperatively with others. Well articulated programs, coordinated on a sound basis by different levels of education, can also stand as a working symbol of a cooperative future.

Educational institutions are constantly being bombarded with demands for "excellence." Educational excellence can only be achieved only when processes are in place which both develop individual potential and improve human resource productivity. The outcomes of excellence in education provide not only improved human resources in the economic sense, but must also include successful development of individual interests, character, talents, and citizenship. Articulation is a pathway for meeting these multiple objectives. It is a practical and efficient strategy for work-related education and it is a method for motivating youth to continue their education, be concerned with self-development, and to participate in the community in which they live and work.

ENDNOTES

[1] Michael L. Dertouzos et al., Made in America: Regaining the Productive Edge (Cambridge, Mass.: MIT Press, 1989), p. 81.

[2] Dale Parnell, The Neglected Majority (Washington, DC: Community College Press, 1985), p. 111.

[3] Thomas Shannon quoted from introduction in Parnell, p. xii.

[4] John Young, "Defining education to fit the advances of the future," quoted from Parnell, p. 138.

[5] Catherine Foley, Massachusetts Job Outlook: Occupational Employment Projected Changes 1984 to 1995 (Massachusetts Division of Employment Security, January 1987), p. 11.

[6] Foley, pp. 9, 33, 48;

[7] Massachusetts State Council on Vocational Education, Commonwealth Connections: An Inventory of Inter-System Vocational Education Agreements. (Boston: Massachusetts State Council on Vocational Education, Spring 1989), pp. 13-15.

[8] Parnell, p. 139.

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